

8CL5989  
(GP1-0035)

REMARKS

Claims 1 – 12 and 14 – 17 are pending in the present application. Reconsideration and allowance of the claims is respectfully requested in view of the following remarks.

Claim Rejections Under 35 U.S.C. §103(a)

Claims 1 – 12 and 14 – 17 are rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over U.S. Patent No. 5,663,280 to Ogoe et al. ("Ogoe"), U.S. Patent No. 5,041,479 to Ogoe ("Ogoe '479") or U.S. Patent No. 5,399,600 to Buysch et al. ("Buysch") in view of U.S. patent No. 4,130,530 to Marks et al. ("Marks") (Paper 19, page 2).

In making the rejection the Examiner has stated that:

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to add the cyclic siloxane of Marks et al. to the composition of the primary references, in order to depress the melt viscosity without lowering the impact strength.

(Paper 17, page 2).

Applicants respectfully disagree with the Examiner on the grounds that the Examiner has not made a *prima facie* case of obviousness.

The present application is directed at and claims a method for reducing haze in fire resistant polycarbonate compositions comprising blending flame retardant salt with a first polycarbonate to produce a concentrate, pelletizing the concentrate; and blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition (Claim 1).

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496

8CL5989

(GP1-0035)

(C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Mark teaches a plasticized polycarbonate composition comprising high molecular weight aromatic carbonate polymer and a minor amount of a cyclic siloxane plasticizer (See Abstract). Mark teaches that the cyclic siloxane plasticizers are added to polycarbonates to maintain impact strength and improve melt flow (see Example I).

Ogée '280 teaches a carbonate polymer composition comprising a carbonate polymer, a low volatility aromatic phosphate ester compound, and optionally an alkali metal salt having a pH of at least 7 (see Abstract). While Ogée '280 teaches the optional use of alkali metal salts in conjunction with aromatic phosphate ester compounds in polycarbonate resins, it does not teach polycarbonate resins comprising the flame retardant salts and the cyclic siloxane as presently claimed.

Ogée '479 discloses making a concentrate by pelletizing a carbonate polymer comprising one or more additives selected from the group consisting of a metal salt, a halogenated aromatic compound, a metal salt of an inorganic compound, a free aromatic sulfimide, and a fibril forming polytetrafluoroethylene (see Claim 1). Ogée '479, like Ogée '280 does not teach blending a cyclic siloxane with a concentrate comprising a polycarbonate resin and a flame retardant salt, as presently claimed.

Buysch teaches blends of polycarbonate with triphenylphosphane sulphonates and optionally fluorinated polyolefins (see Abstract). Buysch, like Ogée '479 and Ogée '280, does not teach a method for making a flame resistant composition wherein a flame retardant salt and cyclic siloxane are blended with a polycarbonate resin as presently claimed.

The Examiner has asserted that the motivation for adding the cyclic siloxane of Mark to the polycarbonate compositions is to reduce melt viscosity (Paper 17, page 2). The Applicants respectfully disagree and believe that there is no motivation to do so on the grounds that there is no difference in the melt viscosity between a flame retardant polycarbonate composition containing a flame retardant salt and a cyclic siloxane and a similar composition that is devoid of the cyclic siloxane. Thus, despite the fact that Mark in its Table, shows that there is a reduction in the melt viscosity of a polycarbonate resin containing a cyclic siloxane when a viscosity measurement of the composition is made as per

8CL5989

(GP1-0035)

ASTM D1238-70, Condition O, there is no evidence of any reduction in the melt viscosity when the cyclic siloxane is added to a polycarbonate resin containing a flame retardant salt. (Col. 4, lines 35 – 39)

Evidence of this may be seen in U.S. Patent No. 6,353,046 to Rosenquist et al. ("Rosenquist"), which has previously been submitted to the U.S. Patent Office along with the amendment dated October 25, 2002. Rosenquist teaches compositions comprising a perfluoralkane sulfonate and a cyclic siloxane (see Abstract). Rosenquist clearly shows that there is barely any difference in the melt viscosity of the polycarbonate compositions having the cyclic siloxane when compared with those compositions that do not have the cyclic siloxane. For example, an examination of Table 1A in Rosenquist, shows that the melt flow for the compositions of Columns 1 to 3 wherein the polycarbonate compositions contain no cyclic siloxane are 15.2, 15.8 and 15.0 respectively, while the melt flow for the corresponding compositions in Columns 4 to 6 that contain 0.5 parts per hundred (phr) cyclic siloxane are 16.0, 15.7 and 15.1 respectively. For purposes of this discussion, the columns are identified from left to right in increasing order starting from 1. Thus the first column on the left will be Column 1, while the column to the right of Column 1 will be Column 2.

These measurements clearly indicate no substantial difference in the melt of viscosities of compositions containing the cyclic siloxane from those not containing the cyclic siloxane. For example, while the compositions of Column 1 and Column 4 both contain the same amount of flame retardant salt, the melt flow of the composition of Column 4 (containing the cyclic siloxane) is higher (i.e., the melt viscosity is lower). On the other hand, while the compositions of Column 3 and Column 6 also both contain the same amount of flame retardant salt, the melt flow of the composition of Column 3 (does not contain the cyclic siloxane) is lower (the melt viscosity is higher). Similarly, while the compositions of Column 2 and Column 5 contain the same amount of flame retardant salt, there is virtually no difference in the melt flow. This data clearly shows that the cyclic siloxane does not change the melt viscosity in polycarbonate compositions containing the flame retardant salt. Thus the Examiner's contention of a motivation to reduce the melt viscosity is moot as is supported by actual experimental data. One of ordinary skill in the art would not be motivated to add the cyclic siloxane solely for purposes of reducing the melt viscosity when,

8CL5989

(GP1-0035)

clearly, there is no reduction in melt viscosity in a polycarbonate composition containing a flame retardant salt.

In addition, it is submitted that the Examiner has given no indication as to why such a reduction in the melt viscosity would be pertinent to facilitating the development of reduced haze and improved flame retardant properties in a polycarbonate composition containing a flame retardant salt and a cyclic siloxane. In this regard, Rosenquist provides additional evidence that the melt viscosity has no particular effect on the flame retardancy. For example, it may be seen in Table 1A, that despite the fact that there is no significant difference between the melt viscosity of the compositions of Columns 1 to 3 and those of Columns 4 to 6, the compositions of Columns 4 to 6 (which contain the cyclic siloxane) display superior flame retardancy results as witnessed by the superior p(FTP) values. The p(FTP) values in Rosenquist are indicative of the flame retardancy characteristics of a given composition using the Underwriters Laboratories UL94 methodology. The results in the UL94 methodology are expressed in terms of a probability of a first time pass, mathematically expressed as p(FTP), which can range from 0 to 1. In order for a composition to display maximum flame retardant performance in a UL94 test, the probability of a first time pass, or p(FTP) should be as close to 1 as possible (Col. 3, lines 41 - 52). Therefore a composition having a value closer to 1 is generally better in flame retardancy than a composition having a value closer to 0.

Similar results as seen in Table 1A (i.e., showing the lack of a relationship between melt viscosity and flame retardancy) may also be seen Table 1C and Table 2A of Rosenquist. In Table 2A, the compositions of Columns 2 and 3 which do not have the cyclic siloxane, have a higher melt flow (which is indicative of a lower melt viscosity) than the corresponding compositions of Columns 5 and 6 that have the cyclic siloxane, and despite this, the compositions of Columns 5 and 6 have superior flame retardant properties. There is no direct correlation between melt viscosity and flame retardancy. Therefore, since the addition of cyclic siloxane to the polycarbonate composition does not necessarily reduce melt viscosity, and since there is no teaching with respect to the effect of cyclic siloxane on the flame retardancy in Mark, there is no motivation to add cyclic siloxane to the polycarbonate composition containing the flame retardant salt. Thus, once again, the underlying motivation

8CL5989  
(GP1-0035)

as outlined by the Examiner is most.

In addition, even if the Examiner were to maintain that Mark provides a motivation to add the cyclic siloxane to the polycarbonate compositions containing the flame retardant salt, there is no particular expectation of success in doing so. It is noted that allegedly "obvious to try", is not the proper standard for a finding of obviousness. In this regard, the courts have held that a finding of "obvious to try" does not provide the proper showing for an obviousness determination. The requirement for a determination of obviousness is that "both the suggestion and the expectation of success must be founded in the prior art, not in Applicant's disclosure" (emphasis added). *In re Dow Chem.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988). An Examiner, then, cannot base a determination of obviousness on what the skilled person in the art might try or find obvious to try. Rather, the proper test requires determining what the prior art would have led the skilled person to do.

*Id.*

There is clearly no evidence in Mark to show that one of ordinary skill in the art would have any expectation of success in improving flame retardant properties by adding a cyclic siloxane to the polycarbonate composition containing the flame retardant salt. In this regard, Rosenquist, once again, details flame retardant properties for polycarbonate compositions containing a cyclic siloxane without any flame retardant salt (see Column 5 and 6 in Table 2B). The samples showed indeterminable flame retardant properties as indicated by the 'nd' (not determinable) values shown for the UL94 p(FTP) flame retardancy test (see Table 2B; see also Col. 4, lines 14 - 16). Additionally, the drip performance for these two samples (7 out of 10 and 5 out of 5) is high, which is undesirable for a flame retardant composition. Polycarbonate resin having neither flame retardant salt nor cyclic siloxane as shown in Table 2A (Column 1) have a similar flame retardancy that is also indeterminable as indicated by the 'nd' values. The drip performance for the polycarbonate resin is also 5 out of 5, which is undesirable. From these results, it can be clearly seen that the addition of a cyclic siloxane to a polycarbonate resin does not improve the flame retardant properties of the polycarbonate resin. One of ordinary skill in the art would therefore not find any motivation to add the cyclic siloxane to improve the flame retardancy of polycarbonate compositions containing the flame retardant salts. Additionally, because the cyclic siloxane does not

8CL5989  
(GP1-0035)

improve the flame retardancy of a polycarbonate resin, one of ordinary skill in the art would not have any expectation of success in manufacturing a flame retardant composition by combining the cyclic siloxane with a polycarbonate composition containing a flame retardant salt. However, once again, as may be seen from the results in Rosenquist, this is not the case.

A comparison of the results of Table 1A with those of Table 1B in Rosenquist, clearly shows that the addition of potassium perfluorobutane sulfonate (KPFBS) salt to a polycarbonate in quantities of 0.05, 0.06, and 0.07 parts per hundred (phr) shows values of p(FTP) of less than 0.2, while the addition of 0.1 phr of siloxane to the same compositions increases the p(FTP) value to above 0.5 for a composition containing 0.05 phr of KPFBS, while for the compositions containing 0.07 phr of KPFBS, the p(FTP) value is greater than 0.99. Similar results can be seen in Table 2A. This clearly indicates that a synergy exists between the flame retardant salt and the cyclic siloxane when added to a polycarbonate resin.

In summary, since a cyclic siloxane by itself does not in any way improve the flame retardant properties of a polycarbonate resin, and since there is no reduction in viscosity of the flame retardant polycarbonate composition brought on by the addition of the cyclic siloxane at a temperature of 300°C, one of ordinary skill in the art would find no motivation to add the cyclic siloxane to a desired flame retardant composition. However, Applicants upon choosing to add a cyclic siloxane to a polycarbonate composition containing a flame retardant salt were surprised at the unexpectedly superior flame retardant properties achieved as a result of this combination. These results also clearly show a high degree of success where none was to be expected, which, as indicated above, is a condition specified by the courts for non-obviousness.

The present application, in contrast with that of Rosenquist, claims first making a concentrate of a polycarbonate with the flame retardant salt, and then adding to the concentrate the cyclic siloxane and additional polycarbonate resin. Rosenquist does not teach or disclose making concentrates or masterbatches. In attempting to prove that results obtained by combining the concentrate with a cyclic siloxane and additional polycarbonate resin are unobvious over Ogée, Ogée '479 or Buysch in view of Mark, the Applicants would like to point the Examiner to Examples 1, 2, 3 and 4 of the present application where the properties of a flame retardant composition manufactured using a concentrate (Examples 1

8CL5989  
(GP1-0035)

and 3) are contrasted with a similar composition where the concentrate approach was not utilized (Examples 2 and 4). All Examples used a sample thickness of 3.2 millimeters. The results for the average haze are summarized in Table 1 below for convenience.

Table 1

Example #	Concentrate Used	Average Haze (3.2mm)
1	No	1.6
2	Yes	0.7
3	No	3.13
4	Yes	0.71

The results clearly indicate that Examples 1 and 3, which do not use a concentrate, have a significantly higher value of haze over Examples 2 and 4, which are made by using a concentrate. Examples 2 and 4 display a value of haze that is approximately 125% better than Example 1 and approximately 340% better than Example 3. These results clearly show that a sample made by using a concentrate have superior properties in at least one aspect, i.e., haze, over samples that are manufactured without using a concentrate. In this regard, the courts have held that “[w]hen considering whether proffered evidence is commensurate in scope with the claimed invention, Office personnel should not require the applicant to show unexpected results over the entire range of properties possessed by a chemical compound or composition”. See, e.g., *In re Chup*, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987). “Evidence that the compound or composition possesses superior and unexpected properties in one of a spectrum of common properties can be sufficient to rebut a *prima facie* case of obviousness”. *Id.*

Additionally, it is also submitted that the results of superior haze demonstrated by the claimed invention are also clearly unexpected. Neither Ogoe, Ogoe '479", Buysch nor Mark teach or suggest that polycarbonate compositions containing a flame retardant salt and a cyclic siloxane would be expected to have superior haze as has been demonstrated above. In this regard the courts have stated “[a] greater than expected result is an evidentiary factor pertinent to the legal conclusion of obviousness ... of the claims at issue.” *In re Corkhill*, 711 F.2d 1496, 226 USPQ 1005 (Fed. Cir. 1985). Since, as prescribed by the courts, there cannot be a legal conclusion of obviousness, Applicants respectfully request a withdrawal of

8CL5989  
(GPI-0035)

the rejection over Ogoe, Ogoe '479 or Buysch in view of Mark.

In conclusion, as shown above, there is no motivation to add the cyclic siloxane to reduce viscosity, since from the data presented in Rosenquist, it is clear that there is no reduction in viscosity achieved by the addition of cyclic siloxane to polycarbonate compositions containing a flame retardant salt. Additionally, there is no motivation and no expectation of success in combining a cyclic siloxane with a polycarbonate composition containing a flame retardant salt since the cyclic siloxane by itself does not in any way enhance the flame retardant properties of a polycarbonate resin. However, when a cyclic siloxane is added to a polycarbonate resin containing the flame retardant salt, the flame retardant properties of the composition are significantly enhanced over compositions that do not contain the cyclic siloxane. Additionally, when the flame retardant salt is added in the form of a concentrate, the haze is significantly superior when compared with a similar composition where a concentrate was not used. In view of these results, Applicants respectfully request a withdrawal of the rejection over Ogoe, Ogoe '479' or Buysch in view of Mark.

8CL5989  
(GP1-0035)

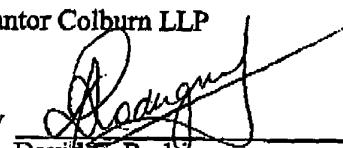
It is believed that the foregoing remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is requested.

If there are any additional charges with respect to this response or otherwise, please charge them to Deposit Account No.07-0852 maintained by Assignee.

Respectfully submitted,

Cantor Colburn LLP

By

  
\_\_\_\_\_  
David E. Rodrigues  
Registration No. 50,604

Date: June 9, 2003  
Customer No.: 23413  
Telephone: (860) 286-2929